

IN THE CLAIMS

Claim 1 (Currently Amended): A protein ~~shown~~ described in (A) or (B) below:

(A) a protein having an amino acid sequence of ~~SEQ. ID No. 2~~ SEQ ID NO: 2 in the Sequence Listing;

(B) a protein having an amino acid sequence of ~~SEQ. ID No. 2~~ SEQ ID NO: 2 in the Sequence Listing, wherein the amino acid sequence includes substitution, deletion, insertion, addition or inversion of one or several amino acids, and wherein the protein has an erythrose reductase activity.

Claim 2 (Currently Amended): A DNA encoding a protein ~~shown~~ described in (A) or (B) below:

(A) a protein having an amino acid sequence of ~~SEQ. ID No. 2~~ SEQ ID NO: 2 in the Sequence Listing;

(B) a protein having an amino acid sequence of ~~SEQ. ID No. 2~~ SEQ ID NO: 2 in the Sequence Listing, wherein the amino acid sequence includes substitution, deletion, insertion, addition or inversion of one or several amino acids, and wherein the protein has an erythrose reductase activity.

Claim 3 (Currently Amended): The DNA as claimed in claim 2, wherein the DNA comprises one ~~shown~~ described in (a) or (b) below:

(a) a DNA containing a base sequence comprising at least nucleotides Nos. 1 to 399 out of the nucleotide sequence described in ~~SEQ. ID No. 1~~ SEQ ID NO: 1 in the Sequence Listing[.];

(b) a DNA hybridizing with a base sequence comprising at least nucleotides Nos. 1 to 399 out of the nucleotide sequence described in ~~SEQ. ID No. 1~~ SEQ ID NO: 1 in the

Sequence Listing or a probe prepared therefrom under a stringent condition, and encoding a protein having an erythrose reductase activity.

Claim 4 (Original): The DNA as claimed in claim 3, wherein the stringent condition is a condition under which washing is performed at a salt concentration corresponding to 2xSSC containing 0.1% SDS at 60°C.

Claim 5 (Currently Amended): The DNA as claimed in claim 2, wherein the DNA comprises a DNA ~~shown~~ described in (c) or (d) below:

(c) a DNA containing a base sequence comprising at least nucleotides Nos. 408 to 1119 out of the nucleotide sequence described in ~~SEQ. ID No. 1~~ SEQ ID NO: 1 in the Sequence Listing[.];

(d) a DNA hybridizing with a base sequence comprising at least nucleotides Nos. 408 to 1119 out of the nucleotide sequence described in ~~SEQ. ID No. 1~~ SEQ ID NO: 1 in the Sequence Listing or a probe prepared therefrom under a stringent condition, and encoding a protein having an erythrose reductase activity.

Claim 6 (Original): The DNA as claimed in claim 5, wherein the stringent condition is a condition under which washing is performed at a salt concentration corresponding to 2xSSC containing 0.1% SDS at 60°C.

Claim 7 (Currently Amended): A cell to which ~~a DNA~~ has been transferred, a DNA as claimed in ~~any one of claims 2 to 6~~ claim 2, in a manner such that the DNA is capable of expressing an erythrose reductase type III that the DNA encodes.

Claim 8 (Currently Amended): A method for producing erythrose reductase type III, comprising the steps of cultivating a cell₁ as claimed in claim 7₁ in a medium to produce and accumulate erythrose reductase type III in a culture liquid₁ and harvesting the erythrose reductase type III from the culture liquid.

Claim 9 (Currently Amended): A protein ~~shown~~ described in (C) or (D) below:

(C) a protein having an amino acid sequence of ~~SEQ-ID No. 4~~ SEQ ID NO: 4 in the Sequence Listing;

(D) a protein having an amino acid sequence of ~~SEQ-ID No. 4~~ SEQ ID NO: 4 in the Sequence Listing, wherein the amino acid sequence includes substitution, deletion, insertion, addition or inversion of one or several amino acids₁ and wherein the protein has an erythrose reductase activity.

Claim 10 (Currently Amended): A DNA encoding a protein ~~shown~~ described in (C) or (D) below:

(C) a protein having an amino acid sequence of ~~SEQ-ID No. 4~~ SEQ ID NO: 4 in the Sequence Listing;

(D) a protein having an amino acid sequence of ~~SEQ-ID No. 4~~ SEQ ID NO: 4 in the Sequence Listing, wherein the amino acid sequence includes substitution, deletion, insertion, addition or inversion of one or several amino acids₁ and wherein the protein has an erythrose reductase activity.

Claim 11 (Currently Amended): The DNA as claimed in claim 10, wherein the DNA comprises one ~~shown~~ described in (e) or (f) below:

(e) a DNA containing a base sequence comprising at least nucleotides Nos. 1 to 399 out of the nucleotide sequence described in ~~SEQ. ID No. 3~~ SEQ ID NO: 3 in the Sequence Listing[.];

(f) a DNA hybridizing with a base sequence comprising at least nucleotides Nos. 1 to 399 out of the nucleotide sequence described in ~~SEQ. ID No. 3~~ SEQ ID NO: 3 in the Sequence Listing or a probe prepared therefrom under a stringent condition, and encoding a protein having an erythrose reductase activity.

Claim 12 (Original): The DNA as claimed in claim 11, wherein the stringent condition is a condition under which washing is performed at a salt concentration corresponding to 2xSSC containing 0.1% SDS at 60°C.

Claim 13 (Currently Amended): The DNA as claimed in claim 10, wherein the DNA comprises a DNA ~~shown~~ described in (g) or (h) below:

(g) a DNA containing a base sequence comprising at least nucleotides Nos. 408 to 1077 out of the nucleotide sequence described in ~~SEQ. ID No. 3~~ SEQ ID NO: 3 in the Sequence Listing[.];

(h) a DNA hybridizing with a base sequence comprising at least nucleotides Nos. 408 to 1077 out of the nucleotide sequence described in ~~SEQ. ID No. 3~~ SEQ ID NO: 3 in the Sequence Listing or a probe prepared therefrom under ~~astringent~~ a stringent condition, and encoding a protein having an erythrose reductase activity.

Claim 14 (Original): The DNA as claimed in claim 13, wherein the stringent condition is a condition under which washing is performed at a salt concentration corresponding to 2xSSC containing 0.1% SDS at 60°C.

Claim 15 (Currently Amended): A cell to which a ~~DNA~~ has been transferred, a DNA as claimed in ~~any one of claims 10 to 14~~ claim 10, in a manner such that the DNA is capable of expressing an erythrose reductase type II that the DNA encodes.

Claim 16 (Currently Amended): A method for producing erythrose reductase type II, comprising the steps of cultivating a cell, as claimed in claim 15, in a medium to produce and accumulate erythrose reductase type II in a culture liquid, and harvesting the erythrose reductase type II from the culture liquid.

Claim 17 (Currently Amended): A protein ~~shown~~ described in (E) or (F) below:

(E) a protein having an amino acid sequence of ~~SEQ. ID No. 6~~ SEQ ID NO: 6 in the Sequence Listing;

(F) a protein having an amino acid sequence of ~~SEQ. ID No. 6~~ SEQ ID NO: 6 in the Sequence Listing, wherein the amino acid sequence includes substitution, deletion, insertion, addition or inversion of one or several amino acids, and wherein the protein has an erythrose reductase activity.

Claim 18 (Currently Amended) A DNA encoding a protein ~~shown~~ described in (E) or (F) below:

(E) a protein having an amino acid sequence of ~~SEQ. ID No. 6~~ SEQ ID NO: 6 in the Sequence Listing;

(F) a protein having an amino acid sequence of ~~SEQ. ID No. 6~~ SEQ ID NO: 6 in the Sequence Listing, wherein the amino acid sequence includes substitution, deletion, insertion, addition or inversion of one or several amino acids, and wherein the protein has an erythrose reductase activity.

Claim 19 (Currently Amended) The DNA as claimed in claim 18, wherein the DNA comprises one ~~shown~~ described in (i) or (j) below:

(i) a DNA containing a base sequence comprising at least nucleotides Nos. 1 to 399 out of the nucleotide sequence described in ~~SEQ. ID No. 5~~ SEQ ID NO: 5 in the Sequence Listing[[]];

(j) a DNA hybridizing with a base sequence comprising at least nucleotides Nos. 1 to 399 out of the nucleotide sequence described in ~~SEQ. ID No. 5~~ SEQ ID NO: 5 in the Sequence Listing or a probe prepared therefrom under a stringent condition, and encoding a protein having an erythrose reductase activity.

Claim 20 (Original): The DNA as claimed in claim 19, wherein the stringent condition is a condition under which washing is performed at a salt concentration corresponding to 2xSSC containing 0.1% SDS at 60°C.

Claim 21 (Currently Amended) The DNA as[[]] claimed in claim 18, wherein the DNA comprises a DNA ~~shown~~ described in (k) or (l) below:

(k) a DNA containing a base sequence comprising at least nucleotides Nos. 408 to 1121 out of the nucleotide sequence described in ~~SEQ. ID No. 5~~ SEQ ID NO: 5 in the Sequence Listing[[]];

(l) a DNA hybridizing with a base sequence comprising at least nucleotides Nos. 408 to 1121 out of the nucleotide sequence described in ~~SEQ. ID No. 5~~ SEQ ID NO: 5 in the Sequence Listing or a probe prepared therefrom under a stringent condition, and encoding a protein having an erythrose reductase activity.

Claim 22 (Original): The DNA as claimed in claim 21, wherein the stringent condition is a condition under which washing is performed at a salt concentration corresponding to 2xSSC containing 0.1% SDS at 60°C.

Claim 23 (Currently Amended): A cell to which ~~a DNA~~ has been transferred, a DNA as claimed in ~~any one of claims 18 to 22~~ claim 18, in a manner such that the DNA is capable of expressing an erythrose reductase type I that the DNA encodes.

Claim 24 (Currently Amended): A method for producing erythrose reductase type I, comprising the steps of cultivating a cell, as claimed in claim 23, in a medium to produce and accumulate erythrose reductase type I in a culture liquid, and harvesting the erythrose reductase type I from the culture liquid.

Claim 25 (Currently Amended): A method for producing erythritol, comprising the steps of acting the protein, having an erythrose reductase activity as claimed in ~~any one of claim 1, 9 or 17~~ claim 1, on D-erythrose, and harvesting a produced erythritol.

Claim 26 (Currently Amended): A method for producing erythritol, comprising the steps of acting the cell, as claimed in ~~any one of claim 7, 15 or 23~~ claim 7, on D-erythrose, and harvesting a produced erythritol.

Claim 27. (New) A cell to which has been transferred, a DNA as claimed in claim 3, in a manner such that the DNA is capable of expressing an erythrose reductase type III that the DNA encodes.

Claim 28 (New): A cell to which has been transferred, a DNA as claimed in claim 4, in a manner such that the DNA is capable of expressing an erythrose reductase type III that the DNA encodes.

Claim 29 (New): A cell to which has been transferred, a DNA as claimed in claim 5, in a manner such that the DNA is capable of expressing an erythrose reductase type III that the DNA encodes.

Claim 30 (New): A cell to which has been transferred, a DNA as claimed in claim 6, in a manner such that the DNA is capable of expressing an erythrose reductase type III that the DNA encodes.

Claim 31 (New): A cell to which has been transferred, a DNA as claimed in claim 11, in a manner such that the DNA is capable of expressing an erythrose reductase type II that the DNA encodes.

Claim 32 (New): A cell to which has been transferred, a DNA as claimed in claim 12, in a manner such that the DNA is capable of expressing an erythrose reductase type II that the DNA encodes.

Claim 33 (New): A cell to which has been transferred, a DNA as claimed in claim 13, in a manner such that the DNA is capable of expressing an erythrose reductase type II that the DNA encodes.

Claim 34 (New): A cell to which has been transferred, a DNA as claimed in claim 14, in a manner such that the DNA is capable of expressing an erythrose reductase type II that the DNA encodes.

Claim 35 (New): A cell to which has been transferred, a DNA as claimed in claim 19, in a manner such that the DNA is capable of expressing an erythrose reductase type I that the DNA encodes.

Claim 36 (New): A cell to which has been transferred, a DNA as claimed in claim 20, in a manner such that the DNA is capable of expressing an erythrose reductase type I that the DNA encodes.

Claim 37 (New): A cell to which has been transferred, a DNA as claimed in claim 21, in a manner such that the DNA is capable of expressing an erythrose reductase type I that the DNA encodes.

Claim 38. (New): A cell to which has been transferred, a DNA as claimed in claim 22, in a manner such that the DNA is capable of expressing an erythrose reductase type I that the DNA encodes.

Claim 39 (New): A method for producing erythritol, comprising the steps of acting the protein, having an erythrose reductase activity as claimed in Claim 9, on D-erythrose, and harvesting a produced erythritol.

Claim 40 (New): A method for producing erythritol, comprising the steps of acting the protein, having an erythrose reductase activity as claimed in Claim 17, on D-erythrose, and harvesting a produced erythritol.

Claim 41. (New): A method for producing erythritol, comprising the steps of acting the cell, as claimed in claim 15, on D-erythrose, and harvesting a produced erythritol.

Claim 42. (New): A method for producing erythritol, comprising the steps of acting the cell, as claimed in claim 23, on D-erythrose, and harvesting a produced erythritol.

Claim 43 (New): A method for producing erythrose reductase type III, comprising the steps of cultivating a cell, as claimed in claim 27, in a medium to produce and accumulate erythrose reductase type III in a culture liquid, and harvesting the erythrose reductase type III from the culture liquid.

Claim 44 (New): A method for producing erythrose reductase type III, comprising the steps of cultivating a cell, as claimed in claim 28, in a medium to produce and accumulate erythrose reductase type III in a culture liquid, and harvesting the erythrose reductase type III from the culture liquid.

Claim 45 (New): A method for producing erythrose reductase type III, comprising the steps of cultivating a cell, as claimed in claim 29, in a medium to produce and accumulate erythrose reductase type III in a culture liquid, and harvesting the erythrose reductase type III from the culture liquid.

Claim 46 (New): A method for producing erythrose reductase type III, comprising the steps of cultivating a cell, as claimed in claim 30, in a medium to produce and accumulate erythrose reductase type III in a culture liquid, and harvesting the erythrose reductase type III from the culture liquid.

Claim 47 (New): A method for producing erythrose reductase type II, comprising the steps of cultivating a cell, as claimed in claim 31, in a medium to produce and accumulate erythrose reductase type II in a culture liquid, and harvesting the erythrose reductase type II from the culture liquid.

Claim 48 (New): A method for producing erythrose reductase type II, comprising the steps of cultivating a cell, as claimed in claim 32, in a medium to produce and accumulate erythrose reductase type II in a culture liquid, and harvesting the erythrose reductase type II from the culture liquid.

Claim 49 (New): A method for producing erythrose reductase type II, comprising the steps of cultivating a cell, as claimed in claim 33, in a medium to produce and accumulate erythrose reductase type II in a culture liquid, and harvesting the erythrose reductase type II from the culture liquid.

Claim 50 (New): A method for producing erythrose reductase type II, comprising the steps of cultivating a cell, as claimed in claim 34, in a medium to produce and accumulate erythrose reductase type II in a culture liquid, and harvesting the erythrose reductase type II from the culture liquid.

Claim 51 (New): A method for producing erythrose reductase type I, comprising the steps of cultivating a cell, as claimed in claim 35, in a medium to produce and accumulate erythrose reductase type I in a culture liquid, and harvesting the erythrose reductase type I from the culture liquid.

Claim 52 (New): A method for producing erythrose reductase type I, comprising the steps of cultivating a cell, as claimed in claim 36, in a medium to produce and accumulate erythrose reductase type I in a culture liquid, and harvesting the erythrose reductase type I from the culture liquid.

Claim 53 (New): A method for producing erythrose reductase type I, comprising the steps of cultivating a cell, as claimed in claim 37, in a medium to produce and accumulate erythrose reductase type I in a culture liquid, and harvesting the erythrose reductase type I from the culture liquid.

Claim 54 (New): A method for producing erythrose reductase type I, comprising the steps of cultivating a cell, as claimed in claim 38, in a medium to produce and accumulate erythrose reductase type I in a culture liquid, and harvesting the erythrose reductase type I from the culture liquid.